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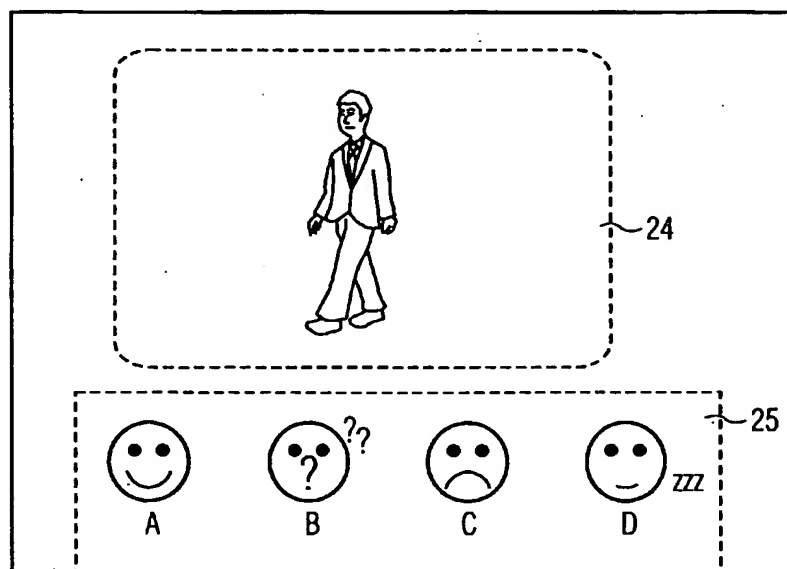G4A AFGX AKS

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WO 2002/003172 A2   US 6190314 B1
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Other: ONLINE: EPODOC, WPI

(54) Abstract Title: A system for communicating user emotion

(57) A communications system has two or more nodes, at least one of the nodes comprising an emotion input device for user selection of a stored emotion type and a transmitter for transmitting the selected emotion type to output devices at other nodes. An output device may be a display for displaying an image representing the selected emotion type, e.g. an icon depicting a smile or a grimace. In this way, a participant in the communication may indicate a currently felt emotion to the other participants. This will be particularly useful in a video conference. The emotion input device may detect user emotions by movement of the input device alone, e.g. a mouse, virtual-reality glove, or computer-controlled camera. The output device may, alternatively, provide a sensory output such as a sound, music, a smell or a physical force such as vibration.

FIG 5

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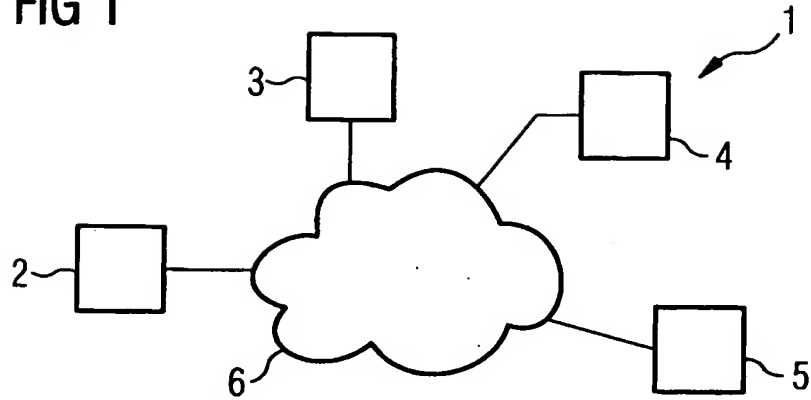
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.
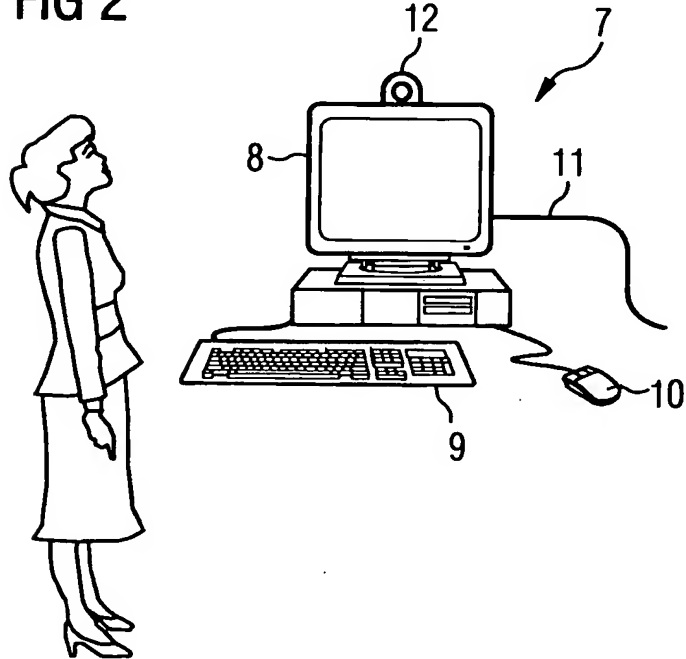Original Printed on Recycled Paper
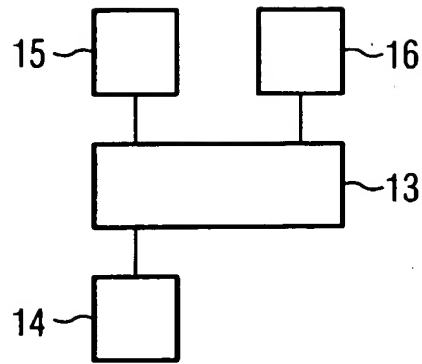
FIG 1

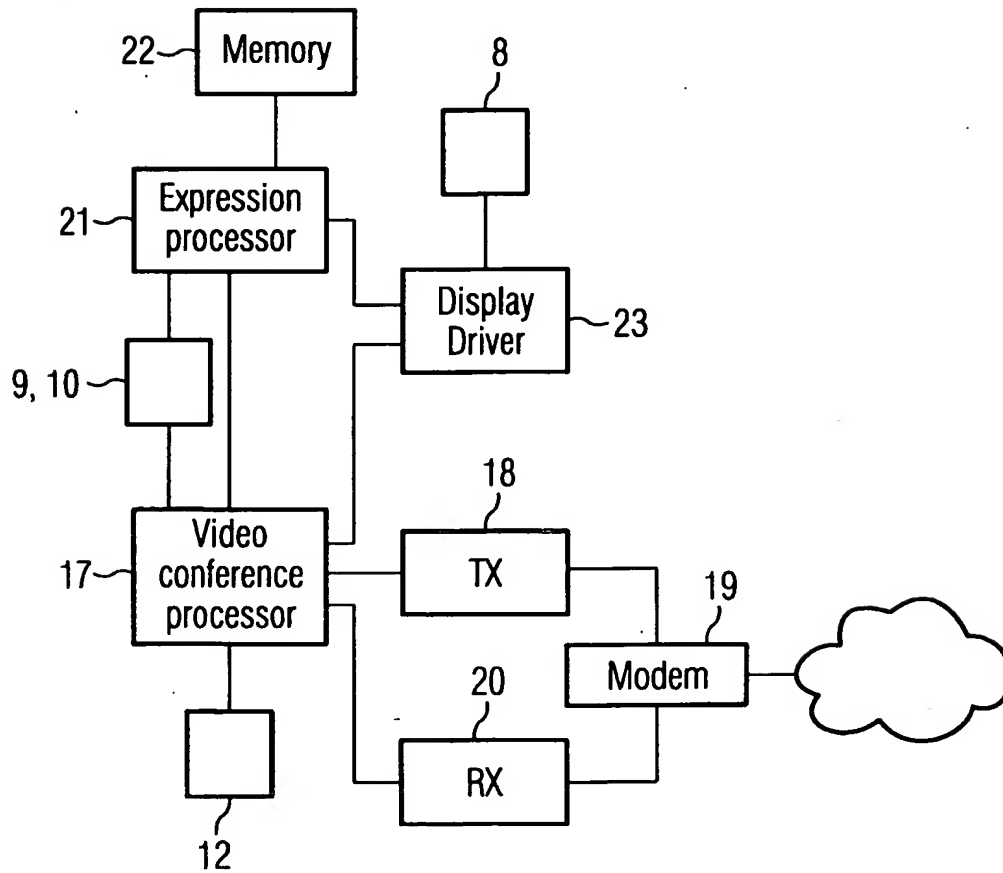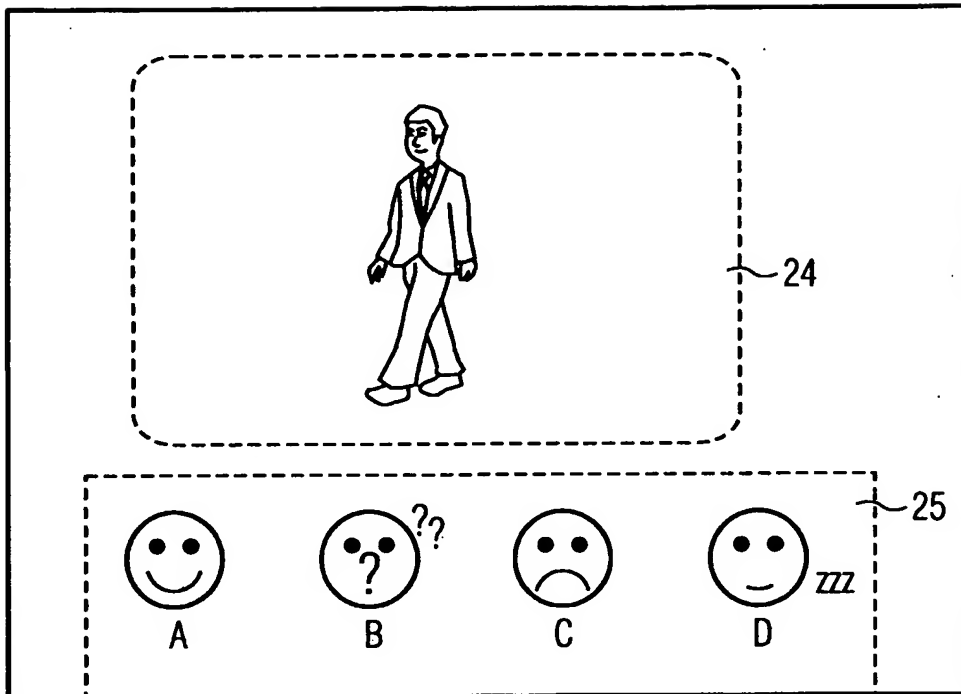**FIG 2**

FIG 3

FIG 4

FIG 5

A COMMUNICATIONS SYSTEM

This invention relates to a communications system.

It is well known that in face to face communication it is not
5   merely the speech that is important but the emotions displayed on the
faces of those taking part and body language. When direct
communication is not possible, and communication takes place via a
telephone, the facial expressions are not seen and the communication
is not as effective.

10   Video conferencing seeks to overcome the limitations by
enabling the faces of the participants to be seen. However, because of
bandwidth restrictions it is not always possible for the facial
expressions to be clearly seen so in effect video conferencing does not
always satisfactorily address the problem it seeks to overcome.
15   Furthermore, not all parties may have the required video conferencing
equipment or access to a communication line having the required
characteristics.

According to the invention there is provided a communications
system comprising two or more nodes at least one of the nodes
20   comprising an emotion input device for user input of an emotion type;
a transmitter for transmitting the input emotion type to the other of the
nodes and an output device at the other node for outputting a
representation of the input emotion type to the user.

The emotion input device may detect user emotions, via the
25   movement of the device alone. Thus the use of the emotion input
device is more akin to natural body movements which occur when
humans communicate. The emotion input device may be any device

that can detect and quantify user motion. As such a range of devices may be employed as an emotion input device; from the PC mouse, through Virtual Reality gloves, to automated visualisation via computer controlled cameras.

5   Alternatively, the input device may enable user selection of an emotion type from a number of stored emotion types.

The output device may be a means to provide a sensory output such as a sound, music, smell, a physical force such as a vibration or some other means that provides sensory stimulation. In the described

10   embodiment the device is a display to display an image conveying the selected type of emotion.

The image may be an icon depicting say a smile or a grimace or some other image indicative of a particular emotion.

A specific embodiment of the invention will now be described,

15   by way of example only, with reference to the accompanying drawing in which:

Figure 1 shows a communications system in accordance with the invention;

Figure 2 shows a communication node of the system shown in

20   figure 1;

Figure 3 shows in schematic block diagram form the architecture of the communication node shown in figure 2;

Figure 4 shows blocks of functionality furnished by the architecture shown in figure 3; and

25   Figure 5 shows a display of a node with a video-conference taking place.

As is shown in figure 1, a communications system 1, in accordance with the invention, comprises a number of network nodes 2 to 5 interconnected via a telecommunications network 6.

Each network node 2 to 5 comprises a computer terminal 7 having a display 8, a keyboard 9, a mouse 10, a connection 11 via a modem to the network 6 and a camera 12 as is shown in figure 2. In addition to the usual computer operations the mouse 10 also provides an emotion input device in a manner to be described later. (Other input devices may be used such as keypads or pressure sensitive devices.)

As will be understood by a person skilled in the art, the computer terminal 7 is formed by a computer architecture such as is depicted in figure 3. A processor 13 is connected to input devices 14 such as the mouse and keyboard to memory 15 and output devices 16 such as the display. The memory 15 provides storage space for the program controlling the operation of the processor 13. In this particular case an application is held which enables video-conferencing of the terminals.

The application provides, in conjunction with the processor 13, the blocks of functionality shown in figure 4. The core function is a video conference processor 17 which enables the connections to the participants and monitors for inputs from the keyboard 9 and mouse 10. The camera 12 provides its video output to the video conference processor 17. If the image is to be transmitted to the other participants it is encoded and packetised before being passed to a transmitter 18 and a modem 19 and thus via the telecommunications network 6 to the participants.

The video conference processor 17 receives information from the other nodes involved in the conference call via a receiver section 20 which is also connected to the modem 19. It strips the information from the received packets and passes part of the received information

5   concerning participants' input emotions to an expression processor 21. The local user may also input emotion types via the mouse which is also connected to the expression processor 21. The expression processor 21 selects from expression memory 22 an expression graphic which is passed to the display driver 23. The display driver is

10 connected to the display 8. It is also connected to the video conference processor 17 to receive decoded video information received from the camera 12 and from the other nodes involved in the conference.

A typical conference display is shown in figure 5 and it comprises a first region 24 and a second region 25. The first region 24

15 displays the video information received from a camera at one of the nodes. The region 25 displays images representing emotions input by the other participants. For participant A, the icon displayed indicates an input emotion of agreement. For participant B, the icon displayed is one indicating a confused state. For participant C, we have an icon

20 representing disagreement and participant D, the icon represents boredom.

The images in region 25 are not fixed but are updated as the input made by the participants changes.

In the described embodiment, a number of actions may be input

25 by the movement of a cursor on the display by the mouse and activation of the right or left button or a middle scrolling wheel. The actions appear in the tables below.

In the first table 1 the action is a reciprocating line in which the cursor is moved from left to right and then back right to left. That basic motion can be varied in its characteristics as shown under the appropriate descriptions. Table 2 shows other actions. Each action

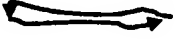5   may be attributed to a particular emotion type.

Table 1

Action	Example	Characteristic		Description
Reciprocating line		Direction	Left	Lateral line, started from right side
			Right	Lateral line, started from left side
			Up	Transverse line, starting from bottom
			Down	Transverse line, starting from top
		Length	Short	Mean length of line over last cycle
			Long	
			Shortening	Mean length decreasing over cycles
			Growing	Mean length increasing over cycles
		Cycle duration	Very fast	Time to return to start another cycle
			fast	
			slow	
		Displacement	Up	Mean line middle moves up over cycles
			Down	Mean line middle moves down over cycles
		End emphasis	Start end	Moves slower at start end of the line
			Turn end	Moves faster at start end of the line
			Out leg	Moves slower out from start end of the line
			In leg	Moves faster out from start end of the line
		Repetition	1	Number of cycles
			2-4	
			>4	

Table 2

Action	Example	Characteristic		Description
Unidirectional line		Direction	Left	Lateral line, started from right side
			Right	Lateral line, started from left side
			Up	Transverse line, starting from bottom
			Down	Transverse line, starting from top
		Length	Short	Length of line
			Long	
		Duration	Very fast	Time to complete line
			fast	
			slow	
		End emphasis	Start end	Moves slower at start end of the line
			Turn end	Moves faster at start end of the line
		Repetition	1	Number of times repeated
			2-4	
			>4	

Action	Example	Characteristic		Description
Single enclosed space		Direction	Left	Anticlockwise motion
			Right	Clockwise motion
		Diameter	Small	Mean diameter over last cycle
			Large	
			Shrinking	Mean diameter decreasing over cycles
			Growing	Mean diameter increasing over cycles
		Cycle duration	Very fast	Time to return to start another cycle
			fast	
			slow	
		Displacement	Up	Mean centre moves up over cycles
			Down	Mean centre moves down over cycles
		End emphasis	Start end	Moves slower at the top
			Turn end	Moves faster at the top
		Repetition	1	Number of cycles
			2-4	
			>4	

Action	Example	Characteristic		Description
Double enclosed space		Direction	Left	Lateral layout, started from right side
			Right	Lateral layout, started from left side
			Up	Transverse layout, starting from bottom
			Down	Transverse layout, starting from top
		Length	Short	Mean length of shape over last cycle
			Long	
			Shortening	Mean length decreasing over cycles
			Growing	Mean length increasing over cycles
		Cycle duration	Very fast	Time to return to start another cycle
			fast	
			slow	

			Displacement	Up	Mean middle moves up over cycles
				Down	Mean middle moves down over cycles
			End emphasis	Start end	Moves slower over the start part of the shape
				Turn end	Moves faster at start part of the shape
				Out leg	Moves slower out from start end of the shape
				In leg	Moves faster out from start end of the shape
			Loop bias	Start	Loop at start end is larger
				End	Loop at start end is smaller
			Repetition	1	Number of cycles
				2-4	
				>4	

It may be that the device provides additional means by which the user may express their emotions. Typically these might include; left button, right button, scroll wheel.

5

These can be used in isolation, in combination, or together with a motion action, to express a specific emotion. Some examples of device actions templates that could be used are given in table 3.

Table 3

Action	Characteristic	Description
Wheel toggle	Slow	The scroll wheel is moved backwards and forwards about a quarter turn
	Fast	
Wheel flick	Down	The scroll wheel is moved about half a turn in one direction
	Up	
	Repetition	
Button click	Left	A button is pressed and released in less than half a second
	Right	
	Repetition	
Button hold	Left	A button is pressed and held for longer than half a second
	Right	
	Duration	
	Repetition	

By way of illustration table 4 indicates some possible emotion types and how they could be associated with the use of the emotion

5   input device.

Table 4

Emotion	Screen pointer device action
Normal	Pointer stationary (or not recognised as a defined motion)
Agree	Slow transverse reciprocating line
YES!	Fast transverse reciprocating line
Disagree	Slow lateral reciprocating line
NO!	Fast lateral reciprocating line
Uncertain	Small slow lateral double enclosed space
Confused	Lateral double enclosed space with start loop bias
Questioning	Large fast lateral double enclosed space
Need more information	Transverse double enclosed space
Distracted	Pointer focus moves to another application
Impatient	Slow wheel toggle
Frustrated	Fast wheel toggle
Taking note	Keyboard entry with focus on the application
Attentive	Transverse unidirectional line
Interruption	Fast repeated transverse unidirectional line
Attention request	Right button click
Attention urgent	Repeated right button click
Amazed	Right button hold
Discount	Wheel flick
Happy	Large slow single bounded space
Sad	Slow lateral unidirectional line
Angry	Left and right button click
Aggressive	Repeated left and right button click

Each terminal may be trained by a particular user to attribute particular actions to emotions. In the training, an emotion type will be

5 presented to the user and the user will manipulate the mouse in a way that the user wishes. Default options are provided in the event that the user does not wish to undergo the training operation.

The images to be displayed to depict a particular emotion may be tailored by the user by selection from an image set or in other ways.

10 Different image sets may be provided for different cultures. For

example, a western set, an oriental set or a middle eastern set may be provided to cater for the cultural heritage of the participants and to avoid offence being caused.

Once the image is selected the expression processor 21 informs
5   the video conference processor 17 which transmits the emotion image identification to the other participants in the conference in an information packet. The packet includes the identity of the user expressing the emotion, a timestamp with the local time and the time since the application was first linked to the conversation, the emotion
10 image identifier, suggested image set, the duration of the emotion. In some applications a URL of a custom image may be transmitted to select a previously used image.

Whilst in the described embodiment, a video conference is established, the invention is applicable to other situations. For
15 example, a conference call may be established and only the region 25 of the display is used to show the images representing the input emotion types. The first region will then be blank. This then caters for the situation where video cameras are not available.

In a similar manner, a simpler system is envisaged in which a
20 telephone is associated with a PC which provides a mouse that is used to express a particular emotion type. The emotion type may then be displayed to similarly equipped participants via the PC display.

Another example is where the emotion type expressed is associated with the user's "presence" data that may be accessed by
25 other users both prior to and within a communication.

In the described embodiment the emotions are displayed as icons. It may be possible to use digital images of the participants in alternative embodiments. The images will comprise a set of photographs of the participant in different applicable emotional states. These images may

5   be transferred when communication is established.

CLAIMS

1. A communications system comprising two or more nodes where users at the nodes may communicate with users at the other nodes, at least one of the nodes comprising an emotion input device for user input of an emotion type; a transmitter for transmitting the input emotion type to the other of the nodes and an output device at the other nodes for outputting a representation of the emotion type to the user.

2. A system as claimed in claim 1 wherein the output device outputs a representation in the form of at least one of: an image, a smell, a force or other user perceivable output.

3. A system as claimed in claim 2 wherein the output device is a display which displays an image as a representation of the selected emotion type.

4. A system as claimed in claim 1 wherein the emotion input device enables a user to make a selection of emotion based on their body movements.

5. A system as claimed in claim 4 wherein the emotion input device comprises a computer mouse.

6. A system as claimed in any preceding claim wherein the transmitter transmits an identifier of the selected emotion.

7.   A system as claimed in claim 6 wherein the transmitter transmits an identifier of an image set from which emotions are to be selected.

8.   A communications system as hereinbefore described with
5   reference to, and as illustrated by, the accompanying drawing.

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-7	EP 1460588 A2 (MATSUSHITA) see whole document.
X	1-7	US 2004/0013252 A1 (GENERAL INSTRUMENT) see Figures 12-14 and paragraphs 93-95 and 125-128.
X	1-7	US 2002/0194006 A1 (PHILIPS) see paragraphs 17-29.
X	1-7	US 2002/0197967 A1 (SCHOLL) see Figures 2 & 3 and paragraphs 27-36.
X	1-7	US 6190314 B1 (IBM) see Figures 1-3 and column 6, lines 49-54.
X	1-7	US 5974262 A (FULLER) see whole document, Figure 7 in particular.
X	1-7	WO 02/03172 A2 (IMMERSION CORP.) see whole document.
X	1-7	WO 2004/088960 A1 (BRITISH TELECOM) see whole document.
A	-	US 2003/0159567 A1 (SUBOTNICK) see whole document.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

Worldwide search of patent documents classified in the following areas of the IPC^{07}

The following online and other databases have been used in the preparation of this search report

ONLINE: EPODOC, WPI